



An Integrated Forest and Fire Monitoring and Forecasting System for Improved Forest Management in the Tropics

Karyn Tabor (PI), John Musinsky (Co-I), Jenny Hewson, Andres Cano, Kellee Koenig, Juan Carlos Ledezma, Eddy Mendoza, Andriambolantsoa Rasolohery, Forrest Melton (NASA Ames), Douglas Morton (NASA Goddard)

Partners: Chris Potter (NASA Ames), Philip Frost (CSIR), Susan Minnemeyer (WRI's Global Forest Watch), GeoVisual Analytics

Private sector partners: Esri, Logi Analytics

Project Summary: CI's Firecast system sends near real-time alerts of fires, risk of fires, and deforestation and engages international users to facilitate the use of near real-time monitoring systems to achieve conservation success

Earth Observations applied: MODIS active fire, MODIS atmospheres (MOD07), GPM IMERG, QUICC 250-m, VIIRS active fire

Purpose and Objective

Firecast is a tool designed to empower local stakeholders with timely fire monitoring and forecasting information for improved management of critical natural ecosystems.

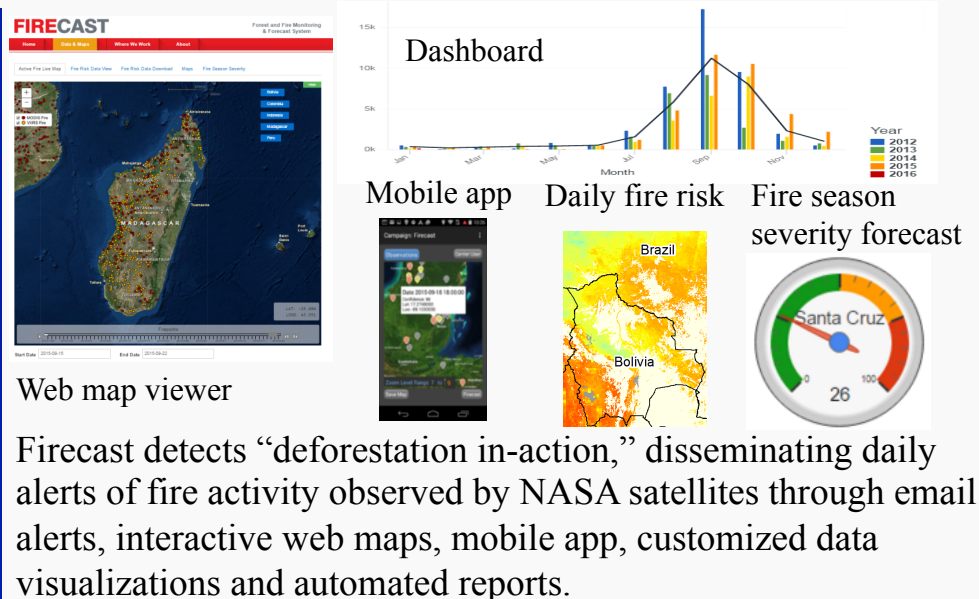
Societal Benefit Area(s): Biodiversity, Climate, Disasters, Ecosystems

Geographic Focus: Bolivia, Colombia, Peru, Madagascar, Suriname, and Indonesia

Target end users: governments, communities, and conservation organizations

Approach

- Capacity building and engagement
Risk: it's risky not to engage
- New NRT Earth observation products
Risk: not communicating with users about new products
- Customized system functionality
Risk: can't please everyone
- Expansion to new geographies and sectors
Risk: long term sustainability of resources



Key Milestones

Milestone Statement	Date
Release of mobile data collection application in Peru and Madagascar	09/15
Release of interactive dashboards to view fire trends and generate customized reports	12/15
Add new NRT products added (VIIRS and QUICC)	03/16
Add expanded and enhanced fire risk model to Firecast through partnership with Global Forest Watch	04/16
Outreach, engagement, capacity building workshops aimed in increase user base (1000+ subscribers) and integrate with CI's investments and REDD+ projects for improved monitoring.	08/17

ARL_{Start} = 3

ARL_{Most Recent} = 8

ARL_{Goal} = 9

Biggest Achievement or Advancement to Date



Received additional funding to enhance Firecast for two additional activities:

**Target Audience:
Environmental Funds**

*Automated reporting on
investment status and trends*

- Fondo Mexicano
- Global Conservation Fund
- Fundacion Natura

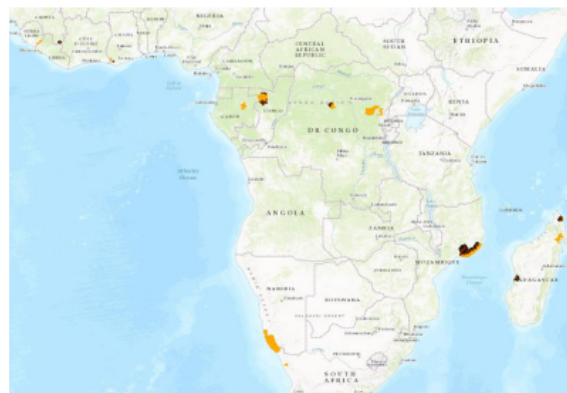
*RedLAC - annual meeting,
Brasilia November 4th-7th*

**Target Audience: Protected
Area Managers Alto Mayo,
Peru**

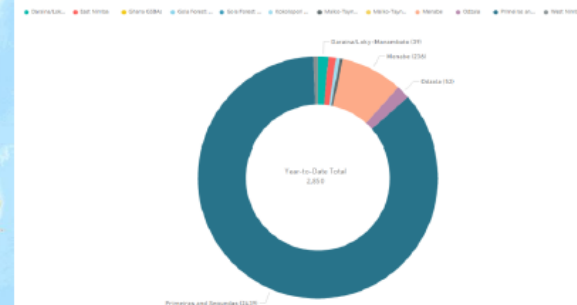
*Testing acoustic alerts for
integration of in-situ
monitoring*

FIRECAST

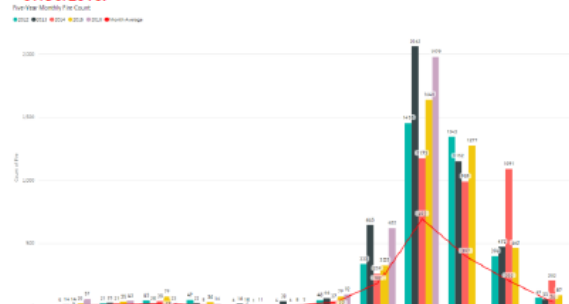
Fire detections for Global Conservation Fund: Africa Region, 01/01/2012 – 09/30/2016.



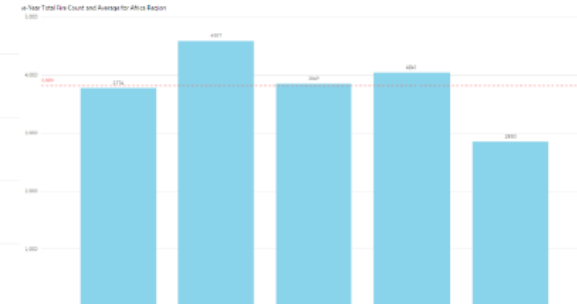
Map of detected fire for Global Conservation Fund: Africa Region, 01/01/2016 – 09/30/2016.



Year-to-date fire detections attributed to each project.



Current fire detections compared with monthly totals for the past 5 years. The red line indicates the 5-year average for monthly fire detections.



Current fire detections compared with annual totals for the past 5 years. The red dotted line indicates the 5-year average.

CHALLENGE: Rapid advancements in operational NRT forest monitoring systems

Why is this a problem?

We used to be the innovators and now there are multiplayerers.

Find + Communicate our niche:

- 1. Low-capacity countries looking for customized systems*
- 2. Environmental investors and the private sector seeking to monitor investments and supply chains*
- 3. High-capacity countries interested in building their own systems*



Meeting with fire managers in Ankazobe special reserve, Madagascar to understand challenges to monitor and manage fires.

PI Overall Assessment: Current Status



Summary of Challenges; Problems; Objective Analysis

Project in schedule of schedule but behind on spending

- Fields program underspent
- *We adjust allocation annually and keep money to cover salary at HQ.*
- Extra funding covered salary for 9 mo
- *Will use some of the money to publish*

The state of the art changed since the project was proposed

- Find new audiences
- Establish niche

Stakeholders change

- Change in administration in Bolivia
- *Looked for new opportunities in Suriname utilizing Bolivia staff*

Signs of Positive Progress

- All promised system milestones are complete
- Firecast survey complete
- Released free-version of onSight app with MODIS and VIIRS
- Forest flammability risk model expanded to Indonesia and global sub tropics (June)
- Recent fires in South America, people are interested in fire danger. Couldn't make traction before. Upcoming workshop in March in Peru

GOALS

1000 subscribers: currently 700

Long-term sustainability: low-cost operation,
partnership with environmental funds &
institutional support

Alignment with CI initiatives:

- TEAM ecological monitoring network
- Sustainable Landscape Partnership (Indonesia)
- REDD+ climate mitigation
- Conservation Equity

From the start, CI was the target organization to host the system

We also identified Global Forest Watch as a partner organization and transitioned forest flammability risk model there

We must carefully consider when our role is becoming redundant and when to transition to new organizations and move on to new innovations

On-time, but still have many activities to wrap up in the final months.

To be safe we will submit a no-cost extension (NCE).



PI Overall Assessment: Transition (4 of 4)



Upcoming outreach/capacity building workshops:

- Peru
- Indonesia
- Madagascar
- Suriname

Continued partnership GFW

- Expand to global sub-tropics (June)
- Switch out MODIS for VIIRS and Sentinel 3A

New directions:

- Monitoring investments
- Making Fire danger interpretable
- In-situ testing
- Alignment with Terrestrial Ecosystem Assessment Monitoring (TEAM)

More proposals and engagement with the PI team. So far it's been great!

New product development?

- Operational burned area product post fire (10-30 m resolution)
- Operational estimated emissions product

CI can amplify applications with new audiences

- International
- Rural communities
- Indigenous groups
- Governments
- Private sector
- International policy arena
- Multi-laterals

Budget progress and future plans to spend down the funding by year.

PI Overall Assessment: Impact



Honest Opinion

I thought we were going to build an innovative technology tool, but ultimately be built a knowledge sharing tool.

I think our greatest impact is how many people gained awareness of near real-time EO data and products for improved land management.

We did a lot of outreach and capacity building in parallel to making our tool more accessible/customized to more people who can't use or don't want to use global systems.

We reached new audiences who were completely unaware of these applications.

Project's Impact/Potential as an Analogy

Our goal is to level the playing field.

Relevant Publications, Awards, Accomplishments

